

# Harsh Maheshwari

☎ (+91) 9654011364  
✉ [harshm121@gmail.com](mailto:harshm121@gmail.com)  
✉ [ee3150517@ee.iitd.ac.in](mailto:ee3150517@ee.iitd.ac.in)

*Senior Undergraduate - Department Of Electrical Engineering  
Indian Institute of Technology, Delhi*

## Education

- 2015–Present **Bachelor of Technology in Electrical Engineering (Power and Automation).**  
Indian Institute of Technology, Delhi, CGPA: 8.438/10 (after 6 semesters)
- 2015 **Central Board of Secondary Education, Class 12<sup>th</sup>,** MDS Sr. Sec. School, Udaipur.  
Score - 93.6%, PCM Score - 97.66%
- 2013 **Central Board of Secondary Education, Class 10<sup>th</sup>,** MMPS, Udaipur.  
CGPA - 10/10

## Internships

- May, 2018 – **Videoken, Bengaluru, Image Classification and Segmentation using Deep Learning.**  
July 2018
- Trained a CNN which used patches of images for classification, inspired by **patchGAN's discriminator**
  - Classified images of different sizes using **spatial pyramidal pooling** layer with InceptionNet
  - Built an OpenCV based semi-automated image segmentation tool which used **object tracking** for minimizing human efforts to segment slides out of images
  - Built an interactive web tool for image segmentation using **Django framework** for minimizing human efforts, used by employees in the company to segment images
  - Achieved high dice coefficient by training a U-net for segmenting images using 12,000 images
- May, 2017 – **Metamor Software Solutions, Hyderabad, Webapp backend using Spring Boot framework.**  
July, 2017
- Built RestAPIs for a B2B webapp using **SpringBoot framework** in **Java** and worked on JWT Authentication for password encryption and security
  - Helped in technical architecture and design of the B2B webapp and documentation of projects

## Projects

- Dec, 2017 – **BoardSnapped, (Prof. Prathosh AP, Dept. of Electrical Eng., IIT Delhi), [Presentation]** .  
Present
- Formalized the problem to detect 'certain' **keyframes** from educational videos for summarization
  - Extracted hand-crafted features from Images to perform unsupervised binary clustering using **GMMs**
  - Used hand-crafted features and techniques to perform unsupervised detection of keyframes
  - Devised a deep-learning pipeline for classification of frames and detection of keyframes using **CNNs** and **bi-directional convolutional LSTM** models
  - Achieved classification accuracy of **99.3%** and keyframe detection accuracy of **97.38%** with precision and recall of **74%** and **77%**
- Currently working on different ways and models to improve the accuracies after error analysis*
- Apr, 2018 – **Skin Segmentation from NIR Images, (Prof. Prathosh AP, Dept. of Electrical Eng., IIT Delhi).**  
Present
- Trained **ResNet38** and **PSPnet** to segment human skin from NIR Images to achieve high dice coefficient
  - Trained a **U-net** to convert RGB images to corresponding NIR images using 5000+ images
  - Trained and stabilized a **Conditional Generative Adversarial Network (patchGAN)** used in **Pix2Pix**
  - Trained a modified Generative Adversarial Network to generate more data for segmentation
- Currently working on GANs for data generation and to exploit databases with segmented RGB images*
- July, 2018 – **Post-Fault Stability prediction using ML, (Prof. BK Panigrahi, Dept. of Elec. Eng., IIT Delhi).**  
Present
- Aimed at transient stability assessment of power system after suffering fault and fault correction
  - Data collected from Phasor Measurement Units (PMUs) of 9 and 39 bus system in Simulink in MATLAB
  - By treating it as a binary classification problem, will use Deep Learning models to predict stability

- Dec, 2016 – **News Analytics**, (Prof. SR Sarangi, Dept. of Computer Science, IIT Delhi).
- July, 2017
- Designed and built a robust **cross platform desktop** application using **JSoup** and **Java Swing** that crawls Google News to get news articles for a given search query and time frame defined by the user
  - Used **BoilerPipe** to extract relevant content from news websites & filtered articles by user defined words
  - Analyzed news trends by plotting time graphs for popularity saved in projects, portable across devices
- This desktop application is being used by some professors in Humanities Department, IIT Delhi to understand trends of news articles for a given search query*
- Jan, 2018 – **Advanced Machine Learning**, (Prof. Prathosh AP), [Course Assignments].
- May, 2018
- Used **FaceNet** model for human face detection and recognition to achieve a validation accuracy of **98%** and classified videos based on a given set of speakers
  - Visualized representations learnt by deep neural networks through **Saliency maps, Occlusion experiments, Gradient Ascent & Inverted Image Representations** and performed **Neural Style Transfer**
  - Detected word boundaries in recorded speech using **bi-directional LSTM** on **TIMIT** speech database
  - Built a python based framework for creating neural networks and trained MNIST digit classifier

## Scholastic Achievements

- 2015 **JEE Advanced:** Achieved AIR of 834 amongst 1.5 million students
- June, 2018 **Huawei Seeds for the Future:** Selected among **4 students** from India selected for a 2-week training program in **China**, studied Chinese Language and Culture in BLCU, Beijing and hands-on experience of **5G, IoT** and **Cloud Computing** in Huawei Headquarters, Shenzhen
- 2018 **A Grade:** Among very few students to be awarded A grade in Advanced Machine Learning
- July, 2018 – **TA | Machine Intelligence and Learning:** Assisting professor in designing course and assignments and grading them for class of 150 students
- Present
- 2015 **NSEP top 1%:** Certified for being in **top 1%** out of 37837 in National Standard Examination in Physics (NSEP) organised by Indian Association of Physics Teachers (IAPT)
- 2014 **K.V.P.Y.:** Secured **AIR 59** in prestigious fellowship by IISc after national level exam and interview
- 2013 **CBSE:** Awarded Certificate of Merit for outstanding performance & scoring A1 in all subjects

## Technical Skills and Relevant Courses

Relevant Courses	Advanced Machine Learning, Intro. to Machine Learning, Probability and Stochastic Processes, Information Theory*, Data Struct. and Algo., Linear Algebra, Deeper Theory of Deep Learning*
Languages & Frameworks	Python, Java, C++, C, HTML, CSS; Keras, MATLAB, Octave

\* courses currently pursuing

## Position of Responsibilities

- Apr, 2017 – **Secretary, NSS IIT Delhi.**
- Jan, 2018 *NSS, IIT Delhi is aimed at motivating students to indulge in nation building and social work*
- Secretary incharge of 4 projects, motivating students for **community service and nation building**
  - Co-led a team of 4 executives in Animal Care project to conceptualize and organize various sensitizing events in IIT and field trips to animal shelters in **collaboration with an NGO**
  - Co-organised NSS orientation for 800+ freshers with a team of 30+ members to introduce NSS
- May, 2016 – **Executive, NSS IIT Delhi.**
- May, 2017
- Executive incharge of 4 projects under NSS to co-organise various events to sensitize students
  - Co-organized **free medical camps** for residents in Munirka Slum and **spread awareness** about common diseases and prevention methods in **collaboration with an NGO**
  - Co-designed an ALP internship which **studied behavior of Indian Society** and help reduce the electricity wastage in households. Conducted by **100+ volunteers in 50+ cities** spread all over India
- Apr, 2017 – **Mentor, Student Mentorship Program, IIT Delhi.**
- Apr, 2018
- Guided 4 first year students to ensure smooth transition into IIT Delhi, ensuring the comfort of incoming